Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims :

[c1-c29] (cancelled)

[c30] (currently amended) A method for reducing the time required for analyzing at least one sample for a parameter of interest which comprises:

selecting a pre-determined signal quality response function value;

selecting a pre-determined integration time T_a;

collecting analytical data from a sample with integration time T_a;

determining whether the analytical data collected from the sample with integration time T_a satisfies the pre-determined signal quality response function value prior to applying a screening rate accelerator toolbox;

applying the screening rate accelerator toolbox if the collected data does not satisfy the predetermined signal quality response function value,

[applying a] said screening rate accelerator toolbox comprising mathematical transform analysis to the data, wherein the mathematical transform analysis is performed using conditions designed to achieve [a] the pre-determined signal quality response function value comprising the value obtained when samples are analyzed without mathematical transform analysis using integration time T_b, wherein T_b is greater than T_a; and

analyzing the data processed by the screening rate accelerator toolbox for the parameter of interest.

[c31] (original) The method of claim 30, wherein the mathematical transform analysis comprises multivariate analysis.

[c32] (original) The method of claim 31, wherein the multivariate analysis comprises neural networks analysis, principal components analysis, partial least squares analysis, linear multivariate analysis, or nonlinear multivariate analysis.

[c33] (original) The method of claim 30, wherein the mathematical transform analysis comprises discrete transform analysis.

[c34] (original) The method of claim 30, wherein the mathematical transform analysis comprises continuous transform analysis.

[c35] (original) The method of claim 30, wherein the mathematical analysis comprises time averaging analysis, smoothing analysis or Savitsky-Golay analysis.

[c36] (original) The method of claim 30, wherein the mathematical transform analysis comprises Fourier transform, Gabor transform, or Hadamard transform.

[c37] (original) The method of claim 30, wherein the mathematical transform analysis comprises wavelet transform.

[c38] (original) The method of claim 37, wherein the wavelet transform analysis comprises a wavelet de-noising algorithm.

[c39] (original) The method of claim 38, wherein the wavelet de-noising algorithm comprises wavelet filters.

[c40] (original) The method of claim 38, wherein the wavelet de-noising algorithm comprises a threshold/shrinkage method.

[c41] (original) The method of claim 30, wherein parameters of the mathematical transform are determined during the course of analysis.

[c42] (cancelled) The method of claim 30, further comprising determining whether the analytical data collected from the sample with integration time T_a satisfies the pre-determined signal quality response function value prior to applying the screening rate

accelerator toolbox and applying the screening rate accelerator toolbox if the collected data does not satisfy the pre-determined signal quality response function value, but not if the collected data does satisfy the pre-determined signal quality response function value.

[c43] (original) The method of claim 30, further comprising the steps of:

determining whether the data processed by the screening rate accelerator toolbox satisfies the pre-determined signal quality response function value; and

if the processed data does not satisfy the pre-determined signal quality response value, re-applying the screening rate accelerator toolbox using a mathematical transform analysis different from the analysis previously applied until the data processed using the screen rate accelerator toolbox either satisfies the pre-determined signal quality response function value or comprises an optimized signal quality response function value.

[c44] (original) The method of claim 43, further comprising repeating the method with a new, larger value for T_a if the data which is optimized using the screening rate accelerator toolbox does not satisfy the pre-determined signal quality response function value.

[c45] (original) The method of claim 30, wherein if the collected data does not require application of the screening rate accelerator toolbox to satisfy a pre-determined signal quality response function value, a shorter pre-determined integration time T_a is selected, and the method is performed using the new value for T_a.

[c46] (original) The method of claim 30, wherein the preset predetermined? signal quality response function comprises one or more measured signal parameters.

[c47] (original) The method of claim 46, wherein at least one of the measured signal parameters comprises signal resolution.

[c48] (original) The method of claim 46, wherein at least one of the measured signal parameters comprises peak shift.

[c49] (original) The method of claim 46, wherein at least one of the measured signal parameters comprises signal distortion.

[c50] (original) The method of claim 46, wherein at least one of the measured signal parameters comprises a signal-to-noise ratio.

[c51] (original) The method of claim 50, wherein the signal to noise ratio ranges from 1 to about 10,000.

[c52] (original) The method of claim 50, wherein the signal to noise ratio ranges from 2 to 5,000.

[c53] (original) The method of claim 50, wherein the signal to noise ratio ranges from 3 to 1,000.

[c54] (original) The method of claim 30, wherein the relative improvement in signal integration time (T_b/T_a) ranges from about 1.5 to 1,000 fold.

[c55] (original) The method of claim 30, wherein the relative improvement in signal integration time (T_b/T_a) ranges from about 1.5 to 500 fold.

[c56] (original) The method of claim 30, wherein the relative improvement in signal integration time (T_b/T_a) ranges from about 1.5 to 200 fold.

[c57] (original) The method of claim 30, wherein the analytical data comprises a first-order array.

[c58] (original) The method of claim 30, wherein the analytical data comprises a multi-order array.

[c59] (original) The method of claim 30, further comprising simultaneous evaluation of each individual sample in an array of samples.

[c60] (original) The method of claim 30, wherein the analytical data comprise spectroscopic, imaging, sensor, or scanning data.

[c61] (original) The method of claim 60, wherein the data further comprise measurements made using Raman, luminescence, ultraviolet-visible molecular absorbance, atomic

absorbance, infra-red, near infrared, surface plasmon resonance, mass spectrometry, X-ray, nuclear magnetic resonance, refractometry, interferometry, scattering, inductively coupled plasma, atomic force microscopy, scanning tunneling microscopy, microwave evanescent wave microscopy, near-field scanning optical microscopy, atomic fluorescence, laser-induced breakdown spectroscopy, Auger electron spectroscopy, X-ray photoelectron spectroscopy, ultrasonic spectroscopy, dielectric spectroscopy, microwave spectroscopy, resonance-enhanced multiphoton ionization, or combinations thereof.

[c62] (original) The method of claim 60, wherein the data further comprise measurements made using photon probe microscopy, electron probe microscopy, ion probe microscopy, field probe microscopy, or scanning probe microscopy techniques.

[c63] (original) The method of claim 30, wherein analytical data is provided using techniques relying on collection of electromagnetic radiation in the range from 0.05 Angstroms to 500 millimeters (mm).

[c64] (original) The method of claim 30, wherein the sample comprises inorganic material, organic material, polymeric material, biological material, or combinations thereof.

[c65] (original) The method of claim 30, wherein the parameter of interest ranges from a single molecule to up to 100% of the sample.

[c66] (original) The method of claim 30, wherein the sample comprises polycarbonate.

[c67] (original) Computer readable media comprising software code for performing the method of claim 30.

[c68-c92] (cancelled)